

Moapa Valley Flash Flood of August 10, 1981 30th Anniversary

- The Moapa Valley Flash Flood was one of the most destructive natural disasters in Clark County and in Nevada with at least \$10 million in damages.
- 762 cows were killed at a dairy in Hidden Valley.
- Extensive flood damages, especially to buildings, also took place in Overton.
- Overall 252 homes were damaged along with 25 businesses.
- Six and a half inches of rain were estimated to have fallen in less than an hour in northeast Clark County.
- Flows in the Muddy River at Glendale were estimated to be 50,000 cubic feet per second which is among the highest on record for southern Nevada. The Muddy River at Glendale crested at a record 30.50 feet.

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On the afternoon and evening of August 10, 1981, thunderstorms moved across central and northeast Clark County unleashing high winds and drenching rains. The heavy rains associated with this thunderstorm activity triggered one of the worst flash floods ever recorded in southern Nevada in the Moapa Valley area resulting in widespread destruction. Even the Las Vegas Valley was not immune as high winds wrecked objects and sent debris flying injuring six people. The damage that was left behind totaled at least \$10 million in 1981 dollars, and unadjusted for inflation, would rank as the eight costliest weather disaster in this area on record.

The summer of 1981 had been relatively dry across southern Nevada prior to August 10th. That day, thunderstorms developed across south-central Nevada along the edge of an upper-level trough of low pressure that was moving southward across the Great Basin. As this thunderstorm activity continued moving southeastward across southern Nevada during the afternoon on August 10th, it interacted with a less organized area of thunderstorms that had extended northward across Arizona. This resulted in thunderstorms developing across the Moapa Valley and Muddy Mountains area around 5 PM which became severe. With considerable moisture in place, thunderstorms were able to unleash heavy rainfall amounts despite their fast movement.

In less than an hour, rainfall amounts of up to six and a half inches fell in northeast Clark County according to bucket surveys conducted after the event by the United States Geological Survey. Most of the heaviest rainfall amounts fell in the North Muddy Mountains and the area near Ute. Although rain did fall in the Moapa Valley, amounts were nowhere as heavy as those recorded several miles to the south. It is believed that the rain that fell in the Muddy Mountains and Ute areas was that of at least a two hundred year storm. A two-hundred-year storm is calculated to be the amount of precipitation expected to be equaled or exceeded every 200 years on average. This rain ultimately drained into the California Wash which runs northeast towards Hidden Valley before it eventually empties into the Muddy River above Moapa.

The tremendous volume of water that poured into the California Wash ultimately ran down the wash triggering a substantial flash flood. Based on post event damage surveys flash flooding began in Hidden Valley around 6 PM on August 10th. The United States Geological Survey estimated the peak flows were around 50,000 cubic feet per second took place between 6:30

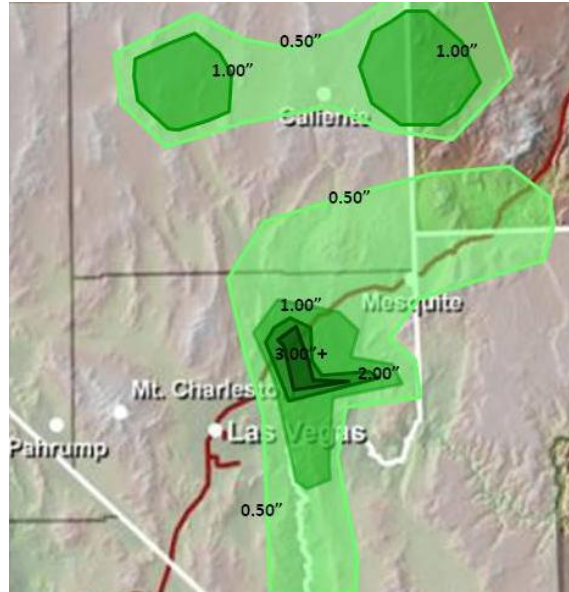
and 7 PM that evening as the floodwaters drained into the Muddy River at Glendale. The crest here reached an all-time record of 30.50 feet that still holds to this date. The flow rates of 50,000 cubic feet per second are considered among the highest of record in this area as well. Additional washes flooded other nearby areas as well that same evening that also drain from the North Muddy Mountains. The Overton Wash, Valley of Fire Wash and Logan Wash also triggered flash floods in northeast Clark County.

The worst damage though was in Hidden Valley, where the floodwaters of the California Wash inundated the community with up to seven feet of water. At the Hidden Valley Dairy, 762 cows were ultimately swept to their deaths with many cows found deceased lying along culverts and debris piles after the floodwaters receded. Some cows were found dead as far away as Overton as they were swept downstream. Twenty-five mobile homes at the farm used to house ranch workers were also damaged. Five miles of railroad tracks were washed out nearby along the Union Pacific track. As the flood swept into Glendale, it grew to a quarter of a mile wide and topped a bridge by nearly six feet. Floodwaters were high enough that debris landed in trees.

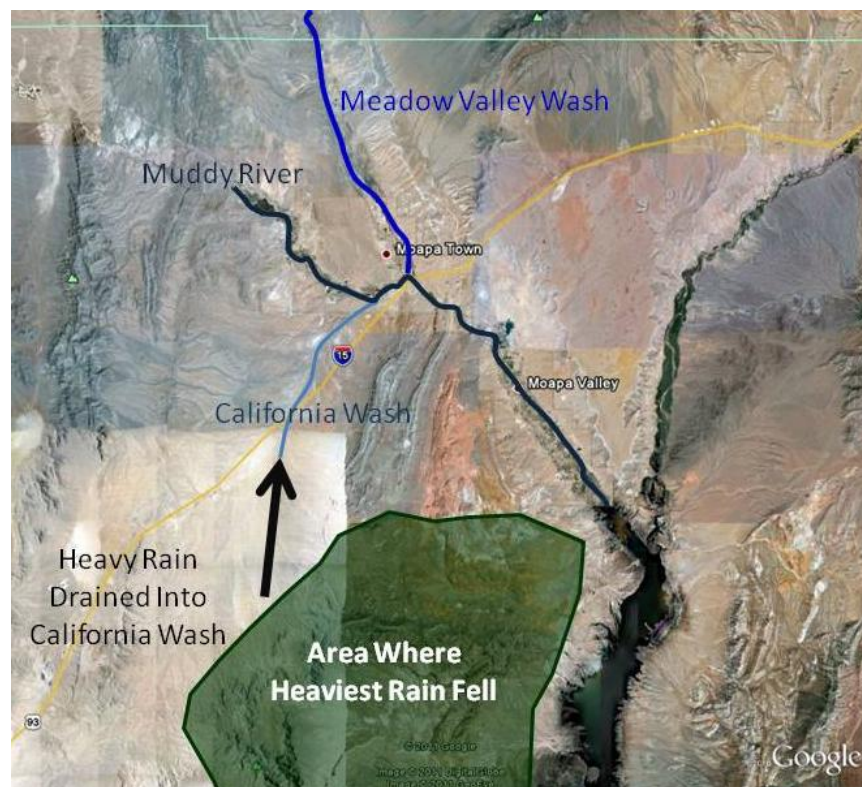
In Overton, floodwaters from the Overton Wash reached eight feet and toppled a diversion dike tearing out a 100 foot section of it. Floodwaters inundated the entire southern portion of the community resulting in 84 mobile homes and 37 homes being destroyed or damaged. An 85 year old woman who lived in a mobile home in Overton was swept from her front porch and eventually was able to cling to a bush. She spent the night clung to the bush in the cold and muddy waters before finally being rescued the next day at 7 AM.

Overall in the Moapa Valley area the storm left 252 homes, 4 rental units and 24 businesses damaged along with 600 acres of farmland. In addition to the 762 cows that died, 20 hogs also perished in the flood. Roads, bridges and dikes suffered \$5 million in damages, with one road in the Lake Mead National Recreation Area eroded 35 feet deep by the force of the floodwaters. However, no human lives were lost in the floods.

The flash flooding in the Moapa Valley in August of 1981 shows how heavy rainfall can result in flooding well away from where the heaviest rain actually occurs. Especially while traveling in rural areas, it is important to be alert in the flood season to the weather around you – not just that in the area where you are currently traveling or located. Floodwaters can often travel miles down washes in the Mojave Desert resulting in a flash flood even where no rain at all may have fallen. As waters flow into washes or other low lying areas they can easily put you or someone else at risk. Driving through floodwaters as well as playing in areas prone to flooding should be avoided altogether. Even though weather radar existed in 1981, it was much less advanced than today's Doppler radar which can estimate total precipitation, among other things. The ability of radar to estimate precipitation totals can greatly increase the ability to warn on the flood potential of storms. In many areas of Clark County, flood control devices have improved the flow of runoff and signs mark some low spots on roads prone to flash floods. Although substantial improvements in weather forecasting and flood control have been made since 1981, floodwaters should never be underestimated.



Map showing rainfall totals from thunderstorms of at least a half of an inch on August 10, 1981 across the area. The dark green area located to the northeast of Las Vegas and very near Moapa received over 3 inches of rain.



Overview of a Flash Flood: The above map shows roughly where the heaviest rain fell on August 10, 1981 which was mainly over the Muddy Mountains. Runoff from this rain drained into the California Wash and then into the Muddy River which flows into the Moapa Valley. This area of heavy rain was primarily responsible for the flooding that took place that day.

Map courtesy of Google.



Map (courtesy of Google) showing where the California Wash passes through Hidden Valley before draining into the Muddy River. It was in Hidden Valley where a dairy was inundated with floodwaters and hundreds of cows were swept to their death. After the floodwaters passed through Hidden Valley, they drained down the Muddy River towards Glendale causing flooding there.



Floodwaters inundate Moapa following a flash flood on August 10, 1981 (Photo Courtesy Las Vegas Review-Journal).



Flood damages to a trailer park in Overton. Photo credit: National Weather Service Western Region Event Service Assessment



Wide view of flood damage to the Hidden Valley Farm. Photo credit: Ken Jones from National Weather Service Western Region Event Service Assessment.

Information in this summary was largely obtained from a Service Assessment done on this event conducted by National Weather Service Western Region Headquarters. Additional information was obtained from various articles published in the *Las Vegas Review-Journal* and the *Las Vegas Sun*. Thanks is given to the staff at the National Weather Service Office in Las Vegas who reviewed this summary.